Annex F1D/6 to the Certificate No. **90**-9

SCOPE of ACCREDITATION

of the

Mechanical and Metallurgical Laboratories and NDT Section

of the

PPC TESTING, INSPECTION AND CERTIFICATION SINGLE MEMBER S.A.

(PPC INSPECTRA)

Materials/ Products to be tested	**Types of test / Properties to be measured**	**Applied methods / Techniques to be used**
Mechanical tests		
Bolts, screws and studs	Tensile test for the determination of - Tensile strength (Rm) - Elongation after fracture (Af) and stress at 0,0048d non-proportional elongation (Rpf) - Proofload	ELOT EN ISO 898.01 E3: 2013, §9.2, 9.3 και 9.6
Weldable steels for the reinforcement of concrete	Tensile test: - Real section - Elongation - Strength at yield Ren - Strength at break R_m - Ratio Rm/ReH	ELOT EN ISO 15630-1 E3: 2019, §5 ELOT EN ISO 15630-2 E3: 2019, §5 * *ELOT EN 10080: 2005* * *ELOT 1421-2 E2: 2007* * *ELOT 1421-3 E2: 2007* (*) they provide limit values and procedures for the conformity assessment against specifications.
Metallic materials	Tensile test / - Maximum force - Elongation at break - Upper and lower yield strength - Tensile strength	ELOT EN ISO 6892.01: 2020 ELOT EN 10002-1:2001 §3,4, 6, 7, 8, 10, 11, 12, 20, 22 Annex A, D, H
Plastics and elastomers	Tensile test / - Elongation at break - Tensile strength at yield - Tensile strength at break	ELOT EN ISO 527-1 E3: 2019 ELOT EN ISO 527-2 E2: 2012
Elastomers	Tensile test/ - Elongation at break - Tensile strength State of stress at 200% elongation	ISO 37:2024

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Galvanized steel guy wire type L, M, H	Tensile test - Minimum Breaking Load F	ELOT EN ISO 6892.01: 2020 GR-98 ** Τ.Ο/ΕΦΕΛΚ/ΣΥΡΜΑΤ/ΕΠΙΤ/Ε/ΕΑΥ** Τ.Ο/ΕΦΕΛΚ/ΣΥΡΜΑΤ/ΕΠΙΤ/Μ/ΕΑΥ** Τ.Ο/ΕΦΕΛΚ/ΣΥΡΜΑΤ/ΕΠΙΤ/Β/ΕΑΥ**
Flexible suspension tape type 1, type 2		ELOT EN ISO 6892.01: 2020 GR-130 ** Τ.Ο/ΕΦΕΛΚ/ΤΑΙΝ/ΑΝΑΡΤ/Ι/ΕΑΥ* * Τ.Ο/ΕΦΕΛΚ/ΤΑΙΝ/ΑΝΑΡΤ/ΙΙ/ΕΑΥ* *
U-Shape Shacklebolts		ELOT EN ISO 6892.01: 2020 GR-170 ** Τ.Ο/ΕΦΕΛΚ/ΔΙΧ.ΣΥΝΔ/ΕΑΥ* *
Suspension link for terminal insulator of U-Shape Shacklebolt & head Suspension link for terminal insulator of socket-umbilical end		ELOT EN ISO 6892.01: 2020 GR-47S ** Τ.Ο/ΕΦΕΛΚ/ΔΙΧ.ΣΥΝΔ/ΕΑΥ* * GR-47S ** Τ.Ο/ΕΦΕΛΚ/ΔΙΧ.ΣΥΝΔ/ΕΑΥ* *
Steel eye nuts		ELOT EN ISO 6892.01: 2020 GR-84** Τ.Ο/ΕΦΕΛΚ/ΠΕΡΙΚ/ΚΡΙΚΟ/ΠΡΟΣΔ/ΕΑΥ* *
Steel hook nuts		ELOT EN ISO 6892.01: 2020 GR-168 ** Τ.Ο/ΕΦΕΛΚ/ΠΕΡΙΚ/ΑΓΚ/ΧΑΛ/ΕΑΥ* *
Anchor rods type 1, 2, 3, 4		ELOT EN ISO 6892.01: 2020 GR-75 ** Τ.Ο/ΕΦΕΛΚ/ΡΑΒΔ/ΑΓΚΥΡ/1 /ΕΑΥ* * Τ.Ο/ΕΦΕΛΚ/ΡΑΒΔ/ΑΓΚΥΡ/2/ΕΑΥ* * Τ.Ο/ΕΦΕΛΚ/ΡΑΒΔ/ΑΓΚΥΡ/3/ΕΑΥ* * Τ.Ο/ΕΦΕΛΚ/ΡΑΒΔ/ΑΓΚ ΥΡ/4/ΕΑΥ* *
Forked shank with hook type 1	Tensile test - Maximum Load F	ELOT EN ISO 6892.01: 2020 GR-121** Τ.Ο/ΕΦΕΛΚ/ΔΙΧ/ΣΤΕΛ/ΑΓΚ/ΕΑΥ* *
Galvanized steel guy wire clips type Light, Medium, Heavy		ELOT EN ISO 6892.01: 2020 GR-113 ** (Τ.Ο/ΕΦΕΛΚ/ΣΥΣΦΙΓΚΤ/ΕΠΙΤ/Ε/ΕΑΥ) ** Τ.Ο/ΕΦΕΛΚ/ΣΥΣΦΙΓΚΤ/ΕΠΙΤ/Μ/ΕΑΥ* * Τ.Ο/ΕΦΕΛΚ/ΣΥΣΦΙΓΚΤ/ΕΠΙΤ/Β/ΕΑΥ**
Welded metallic specimens - Plates - Pipes with diameter >18 mm	Transverse tensile test: - Elongation - Tensile strength R_{ra}	ELOT EN ISO 4136 E2: 2012 except § 5.5.3.2 and § 5.5.3.3 ELOT EN ISO 6892.01:2020 ELOT EN 10002-1:2001 §3,4, 6, 7, 8, 10, 11, 12, 20 Annex A, D, H
Insulators	Tensile test -Specified mechanical load verification	IEC 61109:2025, §12.4 b)
Elastomeric materials	Compression test - Percentage change in thickness	ISO 815-1:2019
Plastic materials	Impact test - Impact resistance (J)	ISO 179-1:2023
Metallic materials	Charpy impact test / Energy absorbed by breakage	ELOT EN ISO 148.01 E2: 2017
Rectangular metallic Weld specimens	Absorbed energy from impact for absorbed energy level: low 20 Joule, medium 70 Joule, high 120 Joule	ELOT EN ISO 148.01 E2: 2017 ELOT EN ISO 9016 E3: 2022
Elastomers	Tear strength	ISO 34-1:2022

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Metallic welded materials	Face bend test (FBB) and Root bend test (RBB)	ELOT EN ISO 5173: 2011 +A1:2012

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Metallic materials	Bend test	ELOT EN ISO 7438:2020
Pin type insulator supports (1A), (1B), (2A), (2B), (3A)	Bend test - Minimum Breaking Load F	ELOT EN ISO 6892.01: 2020 GR-47A ** T.0/MHX/ANT/ΣΤΗΡ/MON/1A/EAY** T.O/MHX/ANT/ΣΤΗΡ/MON/1B/EAY** T.O/MHX/ANT/ΣΤΗΡ/MON/2A/EAY* * T.O/MHX/ANT/ΣΤΗΡ/MON/2B/EA Y* * T.O/MHX/ANT/ΣΤΗΡ/MON/3A/EAY**
Low and medium voltage cables	Measurement of mechanical properties in a cable section: Measurement of breaking stress and elongation	IEC 60811-401:2012+AMD1:2017 IEC 60811-501:2012+AMD1:2018+ AMD2:2023 IEC 60811-100:2012 IEC 60502-1:2021 §18.6 IEC 60502-2:2014+AMD1:2024 §19.7
	Measurement of mechanical properties in insulation and cable sheathing:	IEC 60811-401:2012+AMD1:2017
	Mineral oil immersion tests for sheaths (*sample preparation method)	IEC 60811-404:2012
	Measurement of breaking stress and elongation	IEC 60811-501:2012+AMD1:2018+ AMD2:2023 IEC 60811-100:2012 IEC 60502-1:2021 §18.4 §18.5 IEC 60502-2:2014+AMD1:2024 §19.5 §19.6
Physical tests		
Non cellular plastics - Determination of density	Measurement of relative density (specific gravity) and density / Density	ASTM D 792: 2020, Test method A ISO 1183-1:2025 Test method A
Rubbers	Measurement of SHORE A & D hardness / SHORE hardness	DIN 53505: 2000 ISO 48-4: 2018
Plastics and ebonite	Determination of indentation hardness - Shore hardness	ELOT EN ISO 868:2003
Elastomers	Determination of abrasion resistance / - Density - Volume loss - Abrasion resistance	ISO 4649:2024-Method A ISO 2781: 2018- Method A
	Determination of rebound resilience: (pendulum method)	ISO 4662:2017
Rubber having SHORE A or IRHD hardness from 30 up to 85	Determination of rebound resilience: - Ratio of returned to energy applied - Rebound resilience	DIN 53512: 2000
Plastic Pipes	Thickness measurement - diameter - length - wall thickness	ISO 3126:2005 ASTM D2122-22
Vulcanized or thermoplastic rubber	Accelerated ageing and heat resistance test: Percentage change in fracture stress, elongation at break, hardness and density	ISO 188:2023
Hogh voltage polymer insulators	Measurement of percentage change in polymer casing hardness after the boiling test	EN 62217:2013

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Metallic surfaces	Determination of surface roughness	ΕΛΟΤ EN ISO 21920-3:2023
Paints and varnishes	Cross-cut test Test method for assessing the resistance of paint coatings and varnishes to separation from substrates	ISO 2409:2020

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
	Pull-off test for adhesion Adhesion determining of paint and varnish	ISO 4624:2023
Non-destructive tests		
Ultrasonic non-destructive tests		
Metallic materials	Ultrasonic testing – General Principles	EN ISO 16810:2024
Metallic materials	Ultrasonic testing – Characterization of discontinuities in welds	EN ISO 23279:2017
Metallic materials	Ultrasonic examination of fusion welds in ferrous plates and pipes (pulse-echo technique)	ELOT EN 17640:2019 Ultrasonic examination of welds
Metallic and other materials in which ultrasound can propagate	Ultrasonic thickness measurement in mm (or inches)	ASTM E797/E797M: 2021 ELOT EN ISO 16809:2025
Steel forgings	Ultrasonic testing of ferritic or martensitic steel forgings Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings	EN ISO 10228-3:2016 EN ISO 10228-4:2016
Plain bearings	Non-destructive ultrasonic testing of bond	ISO 4386-1:2019
Metallic materials	Ultrasonic testing of welds-Use of automated phased array technology	ELOT EN ISO 13588:2019 ASTM E2700-20
Non-destructive tests by visual examination		
Metallic materials Fusion-welded joints	Visual examination	EN 13018:2016 EN ISO 17637:2016
Non-destructive tests using penetrant fluids		
Steel and iron castings	Inspection by penetrant fluids	ISO 4987:2020
Steel forgings		EN ISO 10228-2:2016
Metallic materials		EN ISO 3452-1:2021
Plain bearings		ISO 4386-3:2018
Sand, gravity die and low pressure die castings		EN 1371-1:2011
Non-destructive tests using magnetic particles		
Ferro-magnetic iron and steel castings Ferro-magnetic forgings	Inspection with the method of magnetic particles and by using portable electromagnet (Yoke)	EN 1369:2012 ENISO 10228-1:2016
Ferromagnetic metallic materials	Inspection of weldings in steel plates and pipes with the method of magnetic particles and by using portable electromagnet (Yoke)	ELOT EN ISO 9934-1:2017 ELOT EN ISO 17638:2016
Metallic materials	Measurement of thickness of non-magnetic coatings over magnetic base using the magnetic method / Coating thickness	ASTM B499:2009 (2O21) E1 ISO 2178:2016
Non-destructive tests using Eddy-current method		

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Metallic materials	Measurement of thickness of non-magnetic coatings over non-magnetic base using the Eddy-current method / Coating thickness	ELOT EN ISO 2360 E3: 2017
Non-destructive tests by radiographic examination		
Metallic Materials / Welds	Radiographic testing	ΕΛΟΤ EN ISO 17636-1:2022

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Metallurgical tests		
Metallic materials (using specimens)	Metallographic inspection / - Magnification - Estimation of metallographic microstructure - Determination of creep cavitation damage	VGB** - Technische Wishenshaftliche
Metallic materials & metallic materials welds	1. Hardness test according to BRINELL: Hardness HBW: 2,5/187,5 & 2,5/31.75	ELOT EN ISO 6506-1: 2014
	2. Hardness test according to VICKERS: Hardness HV5, HV10, HV30	ELOT EN ISO 6507-1: 2023
	3. Hardness test according to VICKERS: Hardness HV0.5, HV1	ELOT EN ISO 6507-1: 2023 ELOT EN ISO 9015-2:2016
	4. Hardness test according to ROCKWELL B&C: Hardness HRB, HRC	ELOT EN ISO 6508-1:2024
	5. Portable Leeb Hardness Testing	ELOT EN ISO 16859-1: 2016 ASTM A956/A956M-22
	6. UCI Portable Hardness Testing	DIN 50159-1:2022 ASTMA1038-19
Metallic materials	Micrographic determination of grain size (Mean linear intercept length)	ELOT EN ISO 643:2024
Metallic materials & metallic materials welds	Determination of the thickness of surface hardened layers (CHD) Determination of the thickness of surface hardened layers (SHD) Determination of the thickness of surface hardened layers (THD)	ELOT ISO 18203:2018
Metallic materials	Measurement of coating thickness-Microscopical method	ELOT EN ISO 1463:2021
Cables	Insulation and sheath thickness measurement	IEC 60502-2:2024 IEC 60811-201:2023 IEC 60811-202:2023
Metallic welded materials	Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds	EN ISO 17639:2022
Chemical tests		
Low alloyed steels	Chemical analysis by Optical emission spectroscopy OES (C, Si, Mn, Cr, Ni, Mo)	ASTM E415-21
Austenitic stainless steels	Chemical analysis by Optical emission spectroscopy OES (C, Si, Mn, Cr, Ni, Mo)	ASTM E1086-22

Materials/ Products to be tested	Types of test / Properties to be measured	Applied methods / Techniques to be used
Aluminum alloys	Chemical analysis by Optical emission spectroscopy OES (Si, Cu, Mn, Mg)	ASTM E1251-24
Copper alloys	Chemical analysis by Optical emission spectroscopy OES (Cu, Zn, Sn, Pb)	EN 15079:2015
Metallic materials	Chemical analysis by XRF (Cr, Ni, Mo, Mn, Si)	ASTM E1476-4:2022 Par. 7.1

**** * Internal technical documents***

Site of assessment: Laboratory permanent premises, 9 Leondariou Str., Kantza, Pallini, Attiki, Greece.

Approved signatories:

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Non-destructive tests: N. Roussos, E. Zervas, A. Zafeiriou, A. Barmpas, N. Skopelitis,
Metallurgical and Chemical tests: N. Roussos, E. Zervas, M.Mathioudakis, C. Roussos.

This Scope of Accreditation replaces the previous one dated 25.02.2026.
The Accreditation Certificate No. **90**-9, to ELOT ENISO/IEC 17025: 2017, is valid until 02.07.2027.

Athens, 01.09.2026

Konstantinou Evangelos Apostolos
CEO of ESYD